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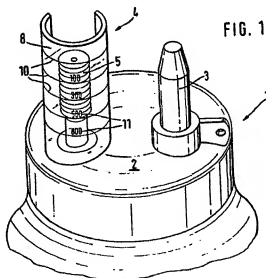
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(54) An aspirator bottle for use in draining wounds

(57) An aspirator bottle provided with a pressure indicator, for example a bellows (5) has a scale (8, 10) associated with the indicator so that a

precise reading of the pressure may be obtained.

In a modification, a second bellows, with its respective scale, is provided, the one bellows serving to provide a readout for a full vacuum range and the other providing a readout for a lower vacuum range.



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FIG. 1

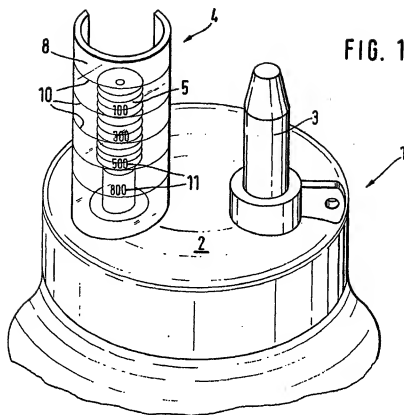
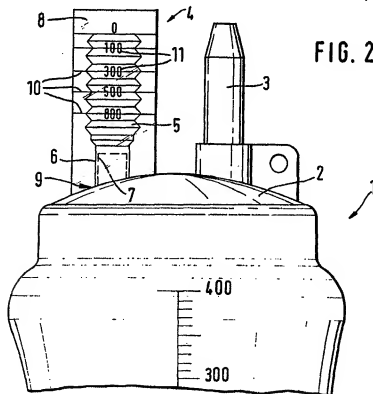
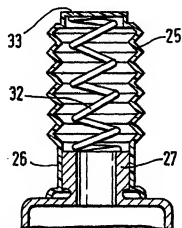
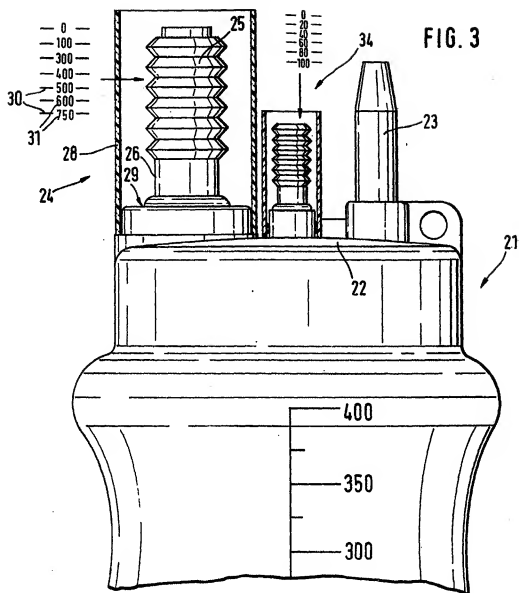


FIG. 2



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## SPECIFICATION

## An aspirator bottle for use in draining wounds

The present invention relates to an aspirator bottle for use in draining wounds, having a pressure indicator, for instance in the form of a bellows of elastomeric material.

- 5 An object of the present invention is to permit estimation of the pressure prevailing in such aspirator bottles, which have been in use for a number of years, to be effected more reliably than has hitherto been possible. Another object is to provide an arrangement which makes it simple to determine such pressure visually.

- With this subject in view, the present invention provides an aspirator for use in the draining of wounds, and having a pressure indicator, for example in the form of a bellows of elastomeric material, characterised by the provision of a scale adapted for use with the pressure indicator and disposed to be read off against the latter.

- In the known arrangements having a folding bellows as aforesaid, it has only been possible for the user to get a rough idea of the extent of expansion of the bellows, and even then it is necessary for the user to have a certain knowledge and experience of the length of the bellows in the pressure-less condition. In contrast, the present invention makes possible to obtain an actual reading, even if it is only rough, and in any event provides guide-lines for positive estimation of bellows expansion and, consequently, of any vacuum still present in the bottle. The same is true for other pressure indicators, as for example a bar fixed to an elastically-yielding membrane.

- 15 In a more specially useful form of the invention the scale support is in the form of a round or cylindrical tube disposed substantially concentrically with respect to the pressure indicator, or in the form of an axial section of such a round or cylindrical tube.

- This more preferred form or development of the invention provides a number of further, useful effects.

- If the folding bellows, which is preferred to be used as the pressure indicator, should become curved somewhat towards one side upon reduction of the pressure in the bottle, reading is still readily possible, when the scale support extends completely or partly around the bellows.

- Furthermore, because the support is around the bellows, the scale will be present at the side to which the bellows is curved. In every case, and furthermore in the case of pressure indicators other than bellows, reading off of the pressure is facilitated because it can be undertaken from different sides. This makes it generally unnecessary for the bottle to be taken by hand for turning it into a reading position or for the user himself to get into some special position to see the scale from the

- right side. Furthermore, where the indicator is a bellows, the scale supports extending partly or fully round it serves the important function of protecting the bellows against damage when the bottle is stored and/or transported. It is generally

- 65 these latter operations which cause damage, more especially at the sharp outer edges of the bellows (these being the most readily damaged parts of the aspirator bottle) and render the bottle useless. Furthermore, the curved form thereof makes the scale support stronger.

- 70 Depending on how far the scale support goes round the pressure indicator, it may be necessary for it to be glass-clear or transparent. However, regardless of this, a transparent scale support is to be preferred. Furthermore, the scale support preferably bears numbers for reading from outside.

- The scale support may be fixed to a cover of the bottle or may be formed in one piece with such a cover. It may, furthermore, be fixed, together with the bellows, to the aspirator bottle, for example by a socket part thereof fitting onto a spigot, on the bottle, to which the bellows also fits. In a further possible design, the scale support may be made in one piece with the bellows, that is to say it is joined at its lower end with the bellows during manufacture.

- In a specially useful further development of the invention, the scale support is associated with a bellows loaded by a coiled or helical spring which may be disposed to abut by one end against an end of the bellows, while the other end abuts against a spigot or retainer by which the bellows is fixed to the bottle.

- The scale support serves to ensure that the pressure indicator can be used with much greater accuracy than has hitherto been possible. Thus, the arrangement can be used, not only for rough reading, but also as a measuring instrument for providing a true reading of the pressure prevailing in the aspirator bottle.

- 100 Lastly, a further way of increasing the accuracy is to provide a second pressure indicator with its respective scale support, one of the indicators being designed for reading the full vacuum range and the other being provided for reading a lower vacuum range, for example 200 to 0 torr, on a greater scale.

- This latter arrangement makes wrong readings at low vacuum levels less likely, so that full use may be made of the vacuum. This is particularly useful for neurological surgery in which, in any event, it is only possible to make use of vacuum levels under about 200 torr. In this case, the vacuum storing effect of the bottle is increased by nearly 50%.

- The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

- Fig. 1 is a perspective view of the upper part of a first embodiment of the aspirator bottle of the invention;

- Fig. 2 is an elevation corresponding to Fig. 1; Fig. 3 is a part-sectional elevation of a second embodiment of the aspirator bottle of the invention; and

- 125 Fig. 4 is a sectional elevation of one of the pressure indicators of the embodiment of Fig. 4, to a slightly enlarged scale.

Referring firstly to Figs. 1 and 2, a generally-

cylindrical suction bottle or aspirator bottle 1 has, on its cover 2, a connection union 3 for a vacuum line (not shown) and a pressure indicator 4.

The pressure indicator 4 comprises a bellows 5 which is air-tightly and adhesively fitted to a spigot 7 of the aspirator bottle cover 2 by way of a socket 6 on its lower end, and in other respects is air-tight.

As so far described, such an aspirator bottle is of normal design as already used in the art.

Adjacent to the bellows 5 there is a scale support or wall 8 extending around the bellows for half a circle or more. At its lower edge 9, which is curved complementarily to the upper surface of the aspirator bottle cover 2 is joined to the latter.

The scale wall 8, made of a glass-clear transparent material, has a scale of lines 10 running around its full outer face and numbers 11, for reading from outside. The numbers 11 are disposed so as to be seen from the front as in the figures, but they may, however, be present so as to be seen from the side as well, if necessary or desired.

In Fig. 1 the pressure-less condition is shown, with the bellows 5 expanded as far as the topmost scale line 10. Under vacuum, the top of the bellows 5 would, generally, be in line with the lowermost scale line 10.

In Figs. 3 and 4 like parts are marked with part numbers increased, in each case, by a value of 20, so that, for example, the scale wall, corresponding to the part 8 in Figs. 1 and 2, is marked with reference numeral 28.

In contrast with the first embodiment of the invention, the aspirator bottle in Fig. 3 has a scale supporter wall 28 in the form of a complete round or cylindrical tube and this fits onto a flat spigot 29. Its scale lines 30 and the scale numbers 31 are shown in the figure to one side of their true positions on the scale wall 28. The scale lines 30 extend right around the scale wall 28 as rings, which, however are interrupted by the scale numbers 31.

As is shown in Fig. 4 to a slightly enlarged scale, a helical spring 32, which is a compression spring, is located in the bellows 25 with its upper end abutting against the top end of the bellows 25 so as to be seated in a shallow recess 33, while the lower end of the spring 32 abuts the spigot 27, within the socket 26.

The increase in length occurring in the bellows as the vacuum goes down is generally dependent upon the spring characteristics of the helical spring 32. The bellows 25 itself, whose elastic expansion is not so truly dependent on pressure changes, is then less important, and may, therefore be made of a relatively soft or deformable material.

The aspirator bottle 21 furthermore has a second pressure indicator 34 which, generally speaking, is of similar design to the pressure indicator 24. However, it is more pressure-sensitive. Expansion other than the bellows of this second indicator 34 only starts when the vacuum has dropped to 100 torr and the scale divisions in

It are of 20° in comparison with 100° on the pressure Indicator 24. This second pressure indicator 34 serves to give a pressure readout over a lower vacuum range than the pressure indicator 24 which gives a readout over the full vacuum range. Although Fig. 3 and the above description give, as an example, a range of 100 to 0 torr for the indicator 34, the latter may advantageously be designed to give an indication over the range of 200 to 0 torr.

## CLAIMS

1. An aspirator bottle, for use in the draining of wounds, having a pressure indicator, characterised by the provision of a scale adapted for use with the pressure indicator and disposed to be read off against the latter.

2. An aspirator bottle as claimed in claim 1, characterised in that the scale is provided on a scale support in the form of a round or cylindrical tube disposed substantially concentrically with respect to the pressure indicator, or in the form of an axial section of such a round or cylindrical tube.

3. An aspirator bottle as claimed in claim 1 or 2, characterised in that the scale support is of transparent material.

4. An aspirator bottle as claimed in claim 3, characterised in that the scale is designed for reading from outside the scale support.

5. An aspirator bottle as claimed in any preceding claim characterised in that the scale support is seated on a cover of the aspirator bottle.

6. An aspirator bottle as claimed in claim 5 wherein the pressure indicator is a bellows of elastomeric material.

7. An aspirator bottle as claimed in claim 6 characterised in that the scale support, together with the bellows, is fixed to the aspirator bottle.

8. An aspirator bottle as claimed in claim 6 or 7 characterised in that the bellows is loaded by a helical spring.

9. An aspirator bottle as claimed in claim 8 wherein the spring abuts by one end against an end of the bellows, while the other end of the spring abuts a spigot by which the bellows is fixed to the bottle.

10. An aspirator bottle as claimed in any preceding claim characterised in that it comprises a second pressure indicator with its respective scale support, one of the indicators being designed for pressure readout for a full vacuum range and the other pressure indicator being designed with a greater scale for a lower vacuum range.

11. An aspirator bottle as claimed in claim 10 wherein said other pressure indicator is designed for a range of 200 to 0 torr.

12. An aspirator bottle substantially as hereinbefore described with reference to and as illustrated in Figs. 1 and 2 of the accompanying drawings.

13. An aspirator bottle substantially as hereinbefore described with reference to and as

illustrated in Figs. 3 and 4 of the accompanying drawings.

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